Maximum Manoeuvrability.

Generate more efficiency and safety in your operations.

Towing capacity up to 195 t (429.900 lbs)

- No adapters, straps or winches needed: completely hands free
- Needs only 15 seconds to connect and raise the nose gear
- Loads the nose gear by automatic one click function or manually step by step.
- Easy hydraulic wheel adjustments for different wheel sizes.
- No driving license needed

mototok®
easy moving

10+ Years of German Engineering and Quality.

3004 / 04-2015

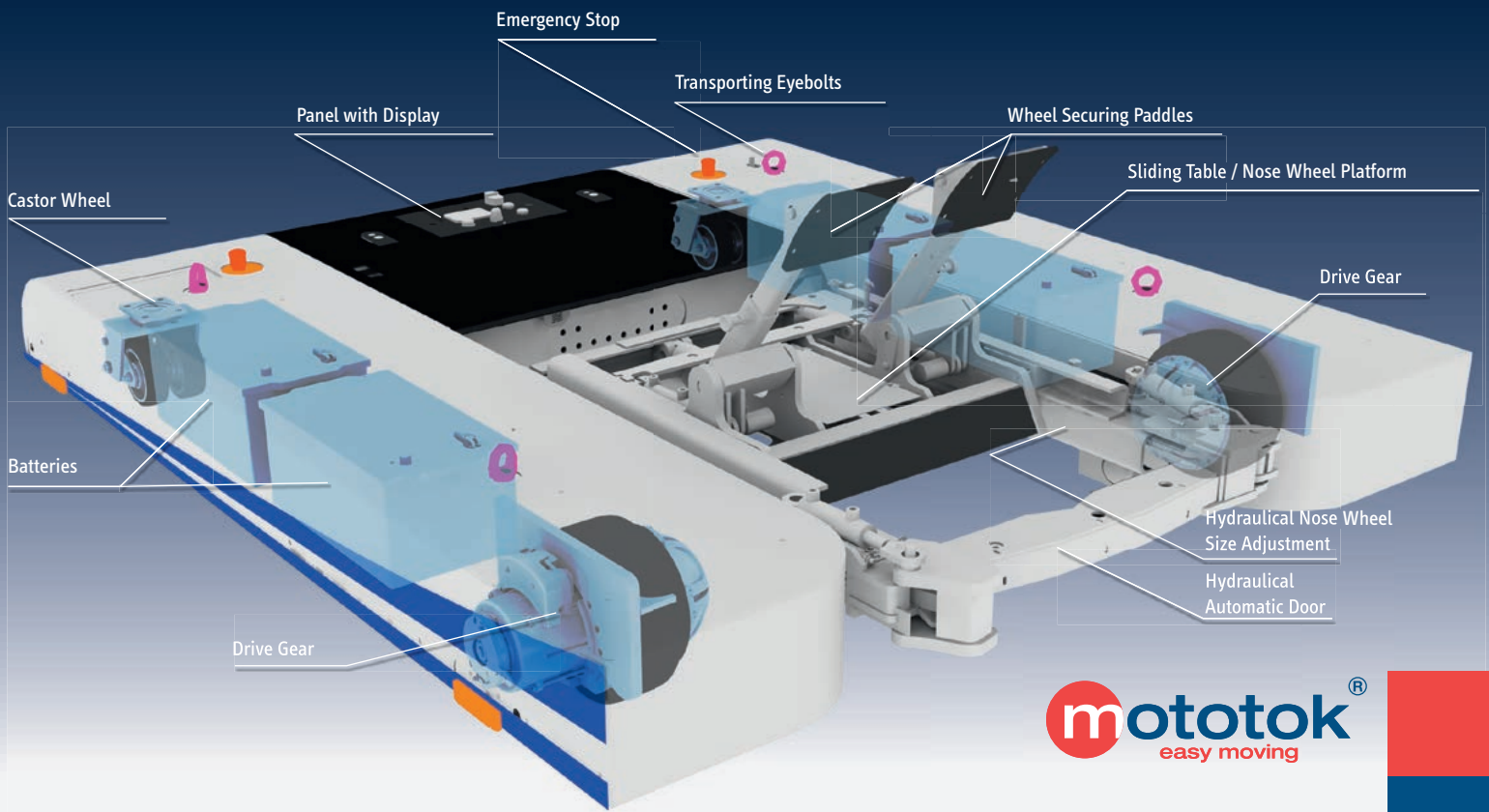
mototok – the high-tech wireless remote controlled aircraft and helicopter tug.

Not a vision, but reality. The revolution is here when it comes to maneuvering aircraft and helicopter. A big idea in a small format! Name: mototok. Distinguishing features: Revolutionary in its simplicity. Extremely compact. Uniquely flexible. And very high performance.

- mototok has high-tech radio remote control with worldwide safety approval for airports.
- mototok provides the optimum balance between minimal dimensions and maximum effect!
- mototok enables the movement of the aircraft to be controlled at every conceivable collision point around the aircraft.
- mototok can be used for almost all aircraft within seconds and without conversion.

Extremely powerful electric motors driven by high-performance, maintenance-free batteries with high cycling capability, regulated and controlled by two high-performance microprocessors provide enormous driving forces. Extremely high initial torque ensures smooth acceleration, particularly at the start. Storage capacity is sufficient for several days, depending on workload. Separate ground-power equipment is often not necessary as most mototok tugs have 12 V or 24/28 V ground-power connection.

Only mototok appliances are capable of manoevering an aircraft's nose a few millimetres away from a hangar wall, and obove all, quickly and effieciently prepare all other aircraft in the hangar for their next duties. Whether in forward or reverse motion, mototok will always manage to create up to 40% more space inside the hangar.



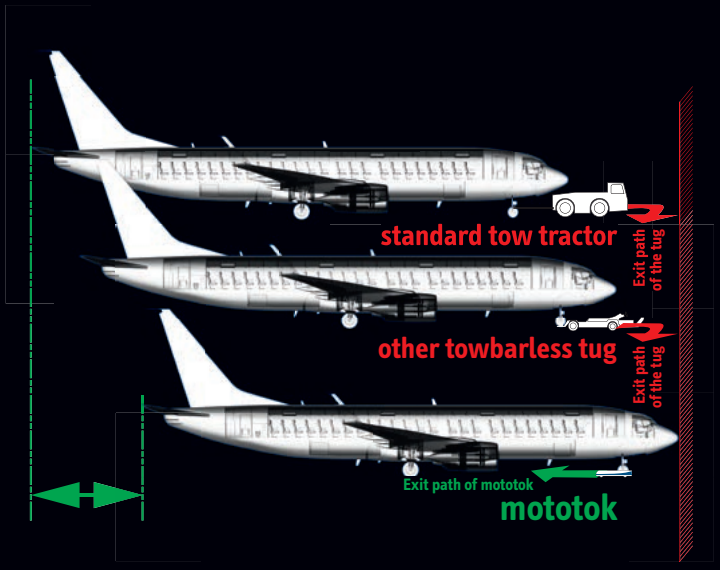
mototok® easy moving

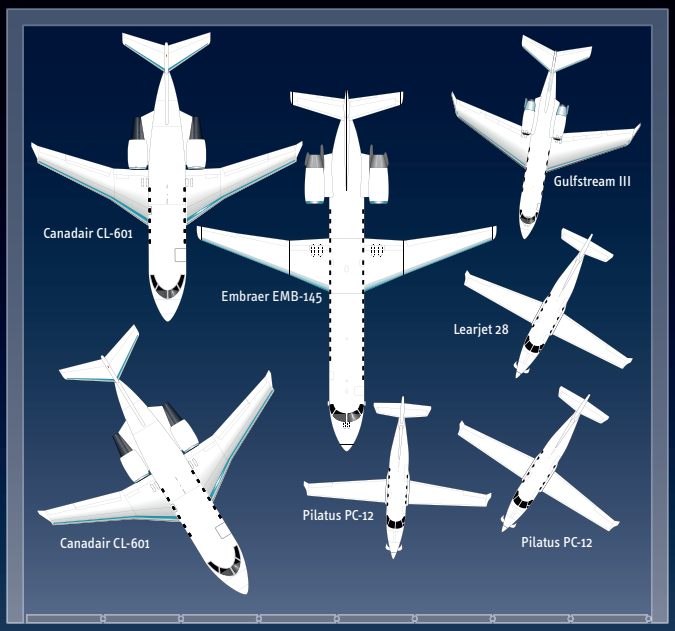
Only mototok generates up to 40% more space in your hangar.

mototok excels in tight situations: Park your aircraft safely, easily and effectively where you want: In the hangars corner, directly towards the hangars wall or near by other aircraft in the hangar. Save space in the process – depending on your hangar situation up to 40%.

Operating with normal tugs with or without a towbar is intricate. Turning the nose wheel whilst maneuvering without moving the aircraft is impossible. And you have to consider the exit path of the tug. Thus parking the aircraft with old technology is unprofitable. You are not able to use your hangars full capacity.

The low height, the compact design and the radio remote control of mototok tugs gives you the fully control of the hangars space. It saves costs through optimized use of limited space.





Typically situation in a hangar – managed with a conventional tow tractor. The biggest disadvantages are:

— All aircraft faces to the hangars gate because you have to consider the exit path of the tow tractor. Parking directly in a hangars corner is impossible.

— The distance between the aircraft has to be acceptably big. Maneuvering with a tow tractor means you have to move the machine to turn the nose wheel. Turning the nose wheel without moving the aircraft is impossible!

You are not able to use your hangars full capacity!

Same hangar with electric wireless remote controlled mototok aircraft tug:

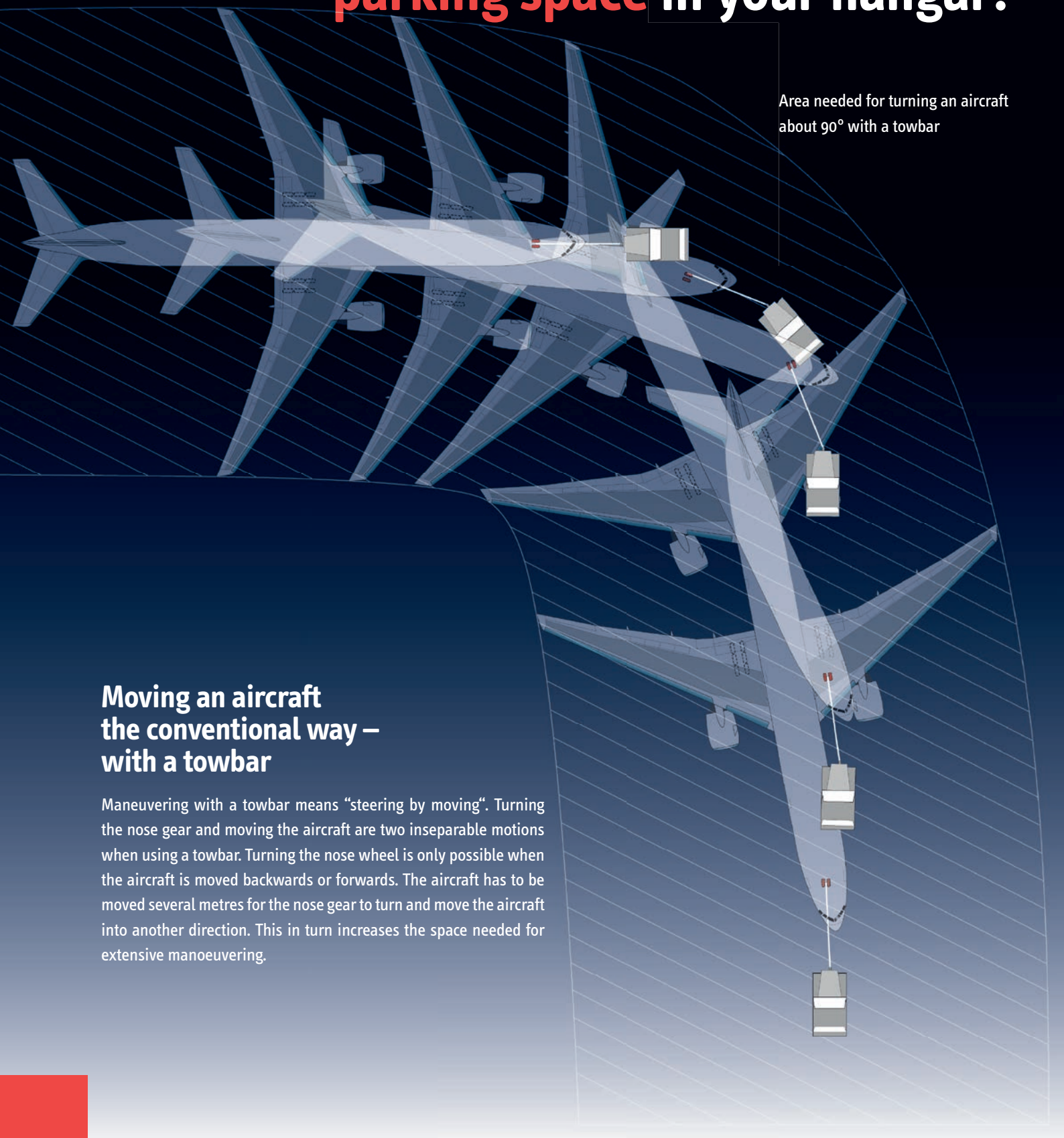
+ Park your aircraft directly towards a wall or in the hangars corner. You don't have to consider the exit path of mototok due to mototoks very compact design.

+ „Stack“ aircraft – park your aircraft with extreme minimal distance. Mototok turns the nose wheel on the spot with no movement of the aircrafts fuselage or wingtips. Maneuvering in extreme narrow situations is from now on no problem.

Increase the capacity of your hangar up to 40% by optimizing parking space!

mototok® easy moving

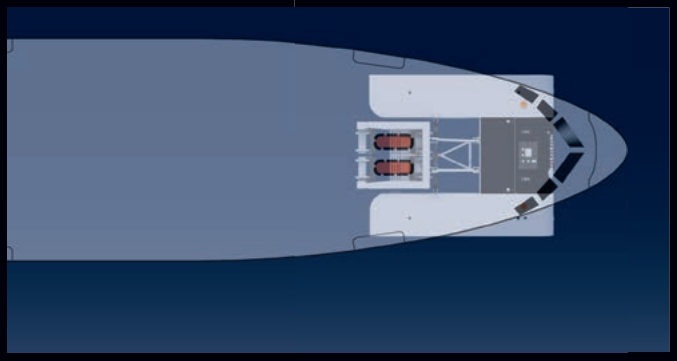
Why does mototok saves parking space in your hangar?

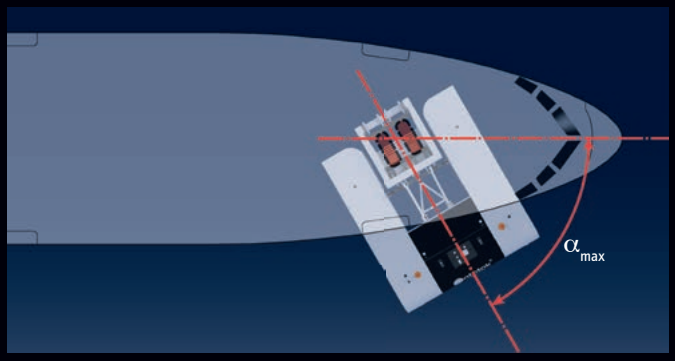


Area needed for turning an aircraft about 90° with a towbar

Moving an aircraft the conventional way – with a towbar

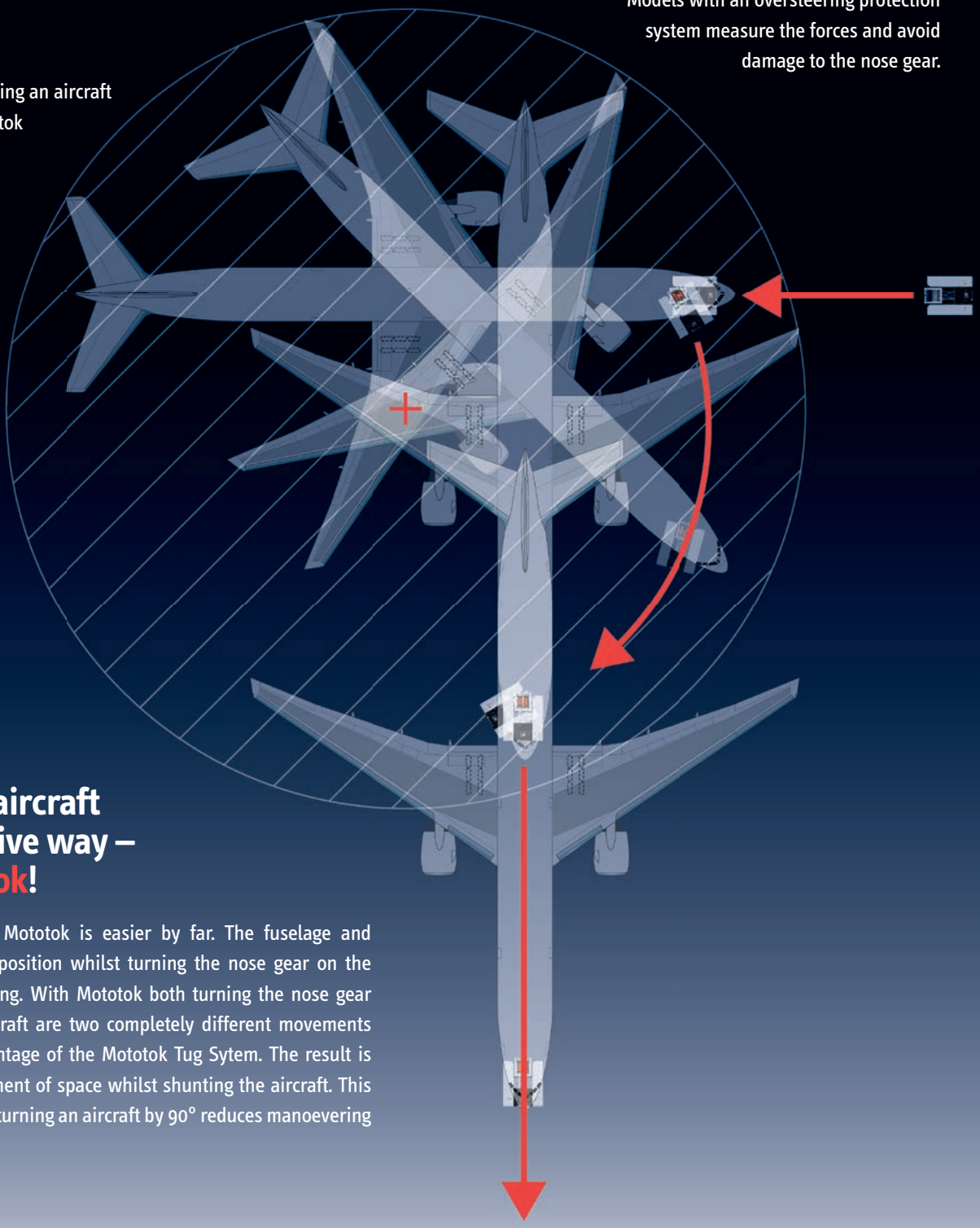
Maneuvering with a towbar means “steering by moving“. Turning the nose gear and moving the aircraft are two inseparable motions when using a towbar. Turning the nose wheel is only possible when the aircraft is moved backwards or forwards. The aircraft has to be moved several metres for the nose gear to turn and move the aircraft into another direction. This in turn increases the space needed for extensive manoeuvering.





Models with an oversteering protection system measure the forces and avoid damage to the nose gear.

Area needed for turning an aircraft about 90° with mototok



Moving an aircraft the innovative way – with mototok!

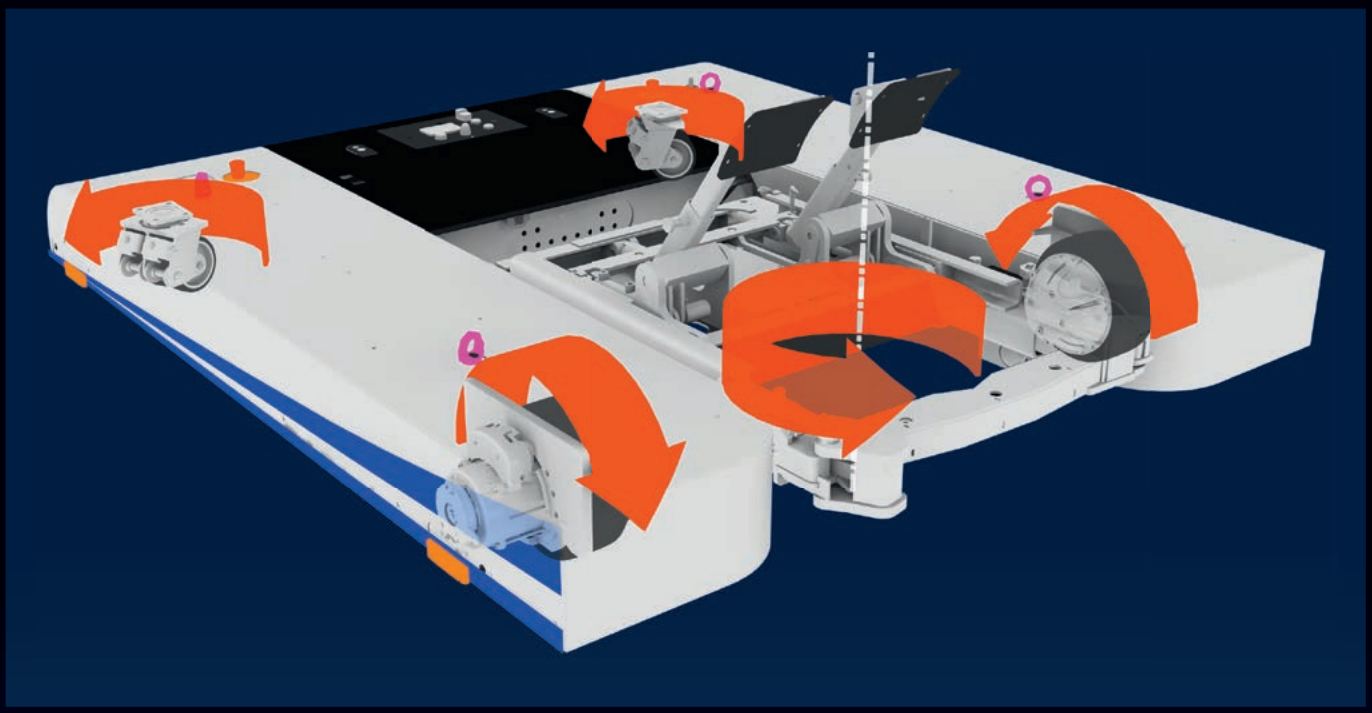
Manouevering with Mototok is easier by far. The fuselage and wingtips remain in position whilst turning the nose gear on the spot for manoeuvering. With Mototok both turning the nose gear and moving the aircraft are two completely different movements – the deciding advantage of the Mototok Tug Sytem. The result is a minimum requirement of space whilst shunting the aircraft. This example shows that turning an aircraft by 90° reduces manoevering space to a circle.

mototok® easy moving

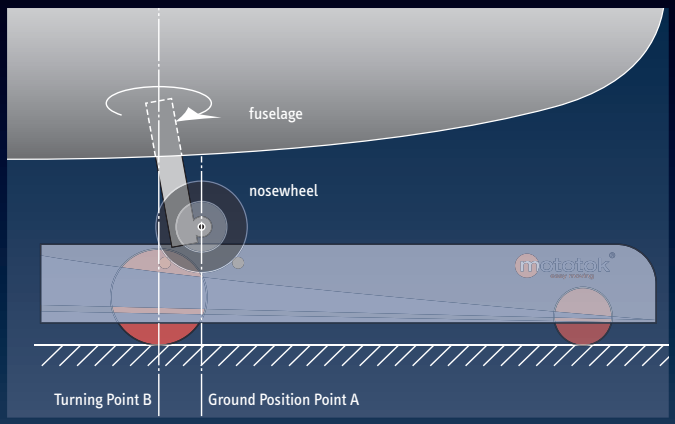
Turning on the spot with no wingtip movement.

The mototok principle.

Learn more:
www.mototok.com/turn

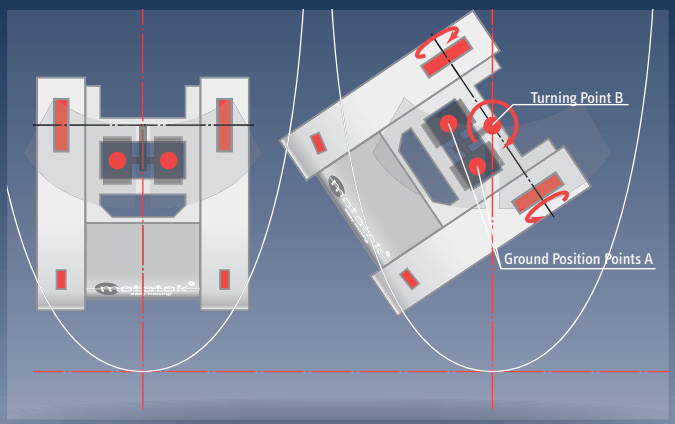


A nosewheel is basically offset in order to remain safely on track during take-off and landing. Due to this, ground position point A is not identical with construction related axis B on the landing gear.

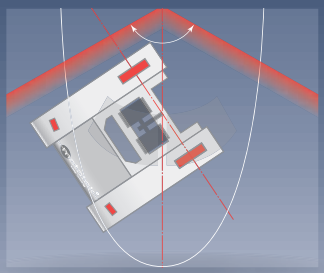


mototok is intelligent. The steering of a mototok is performed through different rotating speed of both processor-controlled wheel-hub motors. A perfect turn on the spot is naturally no problem: one motor rotates forwards, the other backwards. Both motors recognise rotational resistance and carry out a precise turning manoevre around axis B on landing gear. The aircraft remains almost immovable from its location during the turn. Therefore, accidents through collisions are practically out of the question. Additionally, transverse forces are not inflicted upon the nosewheel and landing gear hence no damgage will be caused to the bearings and other landing gear related components.

According to the relative rotation speed of both driving wheels every route can be performed.



With mototok, a shearing off of the nose wheel stop whilst turned around its axis is impossible because the adjustable electronic torque control effectively prevents this.



mototok® easy moving

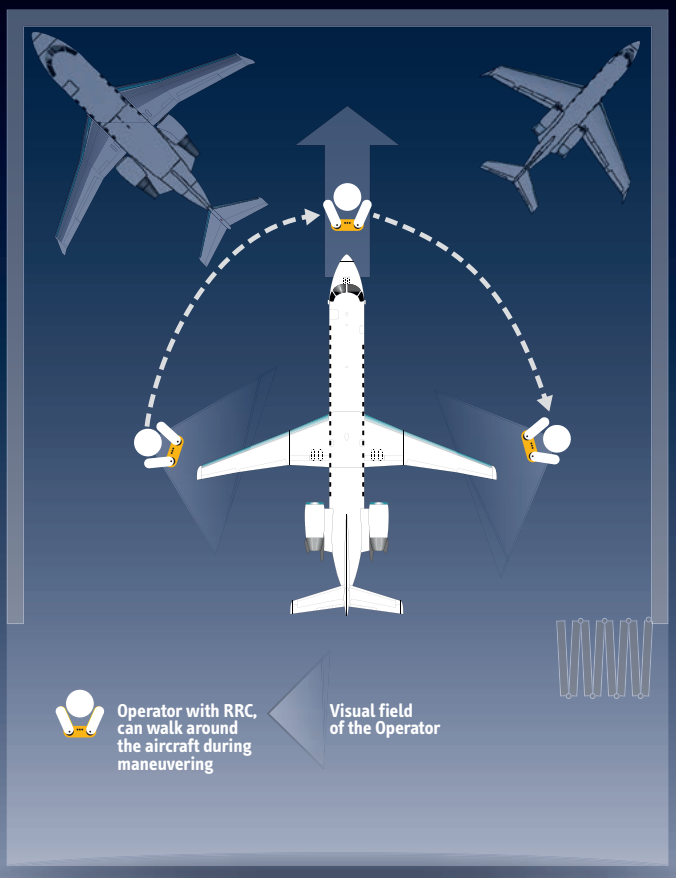
More advantages of using an electric driven mototok-tug.

Cost effective.

- Low personnel costs by means of wireless transmission control – the operator is essentially a “wing walker” himself.
- Increases the number of aircrafts in your Hangar.
- No driving licence required.
- Extremely low maintenance costs, no maintenance plan necessary.

Towing with a conventional Tractor:
At least 4 Persons needed

Circumferential view – only one person with a radio remote control (RRC) needed for moving the aircraft



Safe.

- Hydraulic fixation of the nose wheel.
- Fully programmable speeds, braking curves, initial torques and over steering protection – Controlled and regulated by internal microprocessor.
- Gentle treatment of the landing gear with a built in hydro-pneumatic system.
- 100 % circumferential visual control around the aircraft. No knocks. No collisions. Optimum use of limited space!

Flexible.

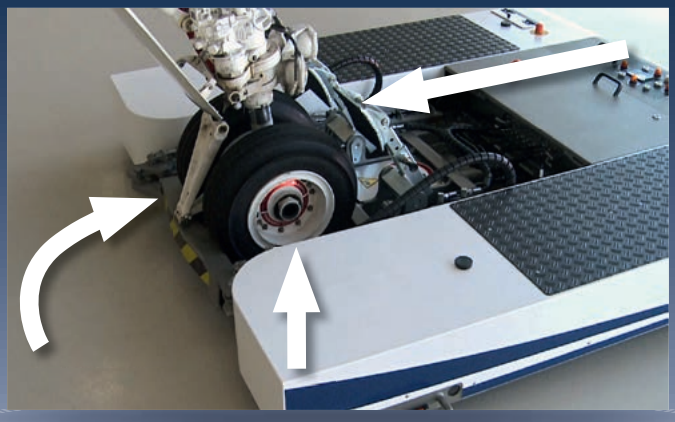
- Maneuver a wide range of aircraft with the same mototok-model – ONE MACHINE for all corporate aircraft single or double nose wheel including helicopters.
- Connect the aircraft from the front or the rear.
- Hydraulic nose wheel adjustment – for different nose wheel diameters.

Automatic One-Click Loading. As simple as pressing a button.

Easy-to-use.

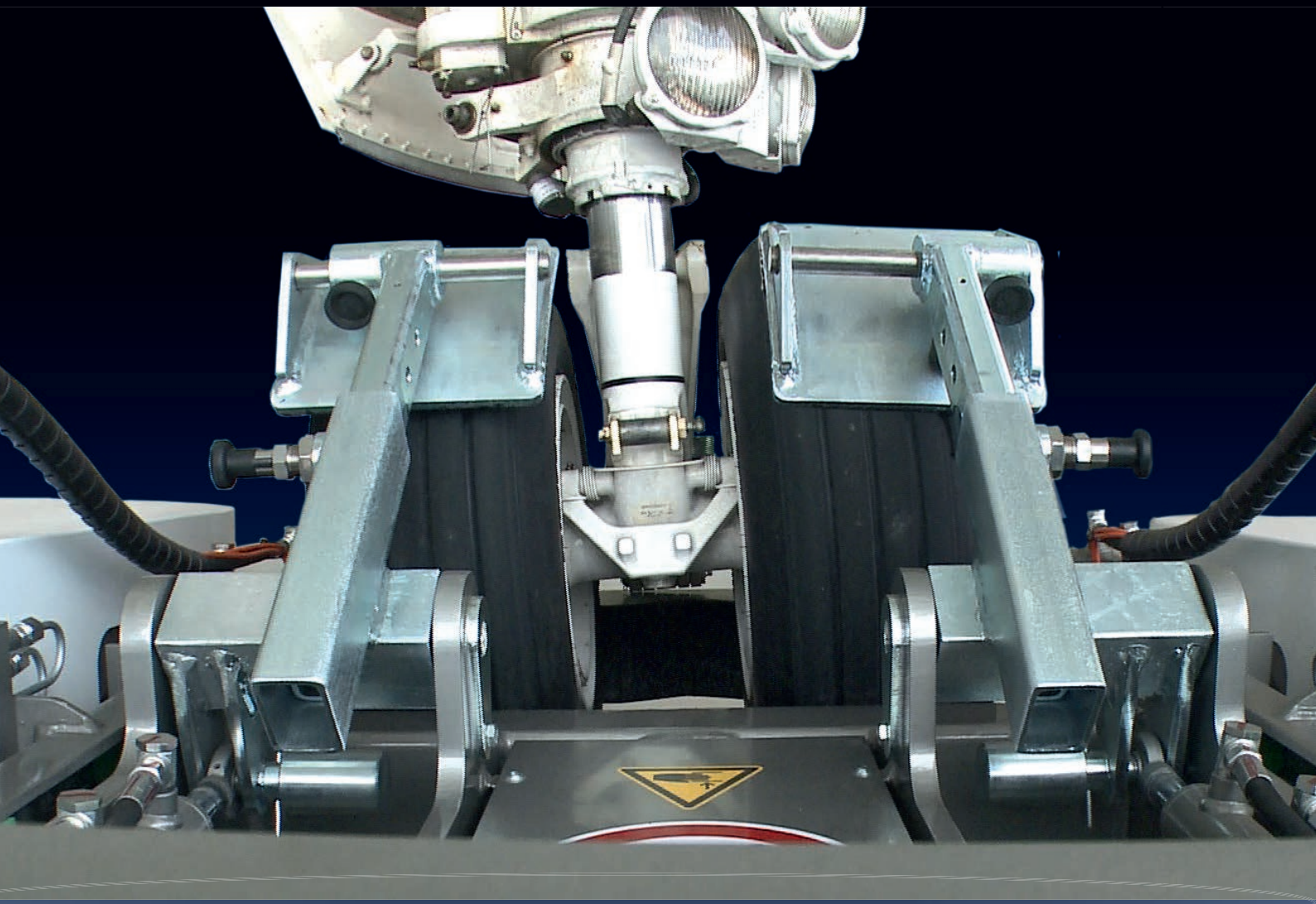
Docking takes a matter of seconds from the rear or front of the nose wheel. Simply drive the mototok up to the nose wheel. The wheel is then hydraulically fixed firmly in position and raised – ready for take off! All this with no awkward strap, no inconvenient winch. No bolts or tools are required.

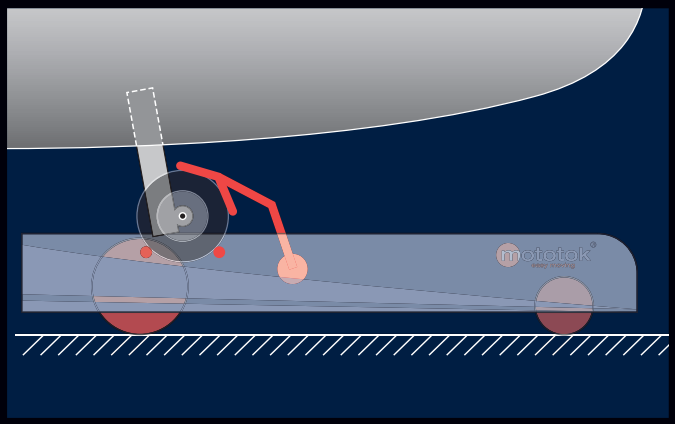
- Radio remote controlled operating under an industrial frequency code approved for airports.
- Automatic connection to the aircraft's nose wheel with one click.
- No straps, no winch, no tools required.



Learn more:
www.mototok.com/autoload

Hydraulical and gentle Clamping of the Nose Wheel: Safety first.



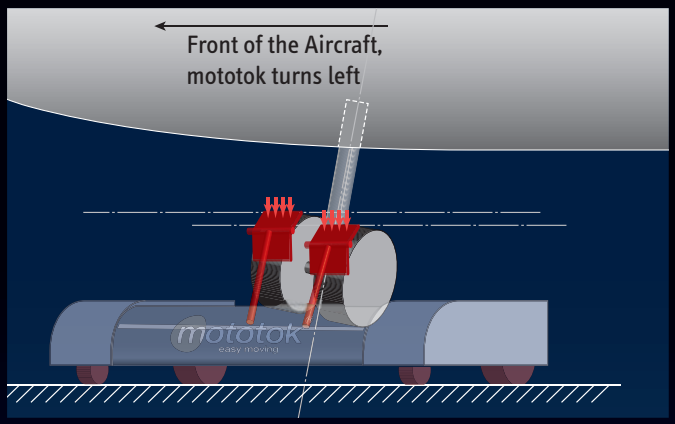


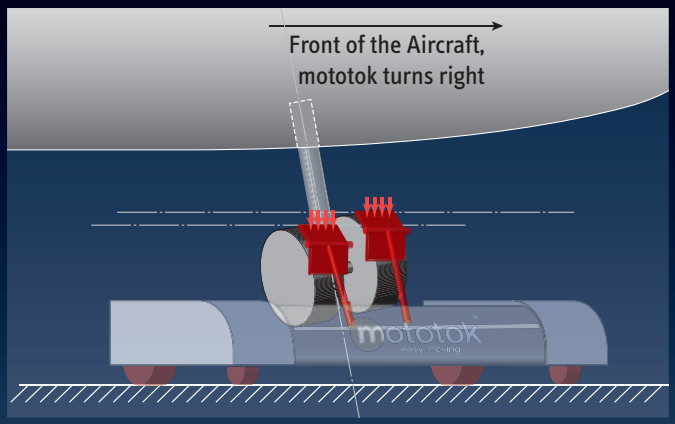
When the nosewheel is raised it is secured by means of the hydro-pneumatically operated wheel securing system.

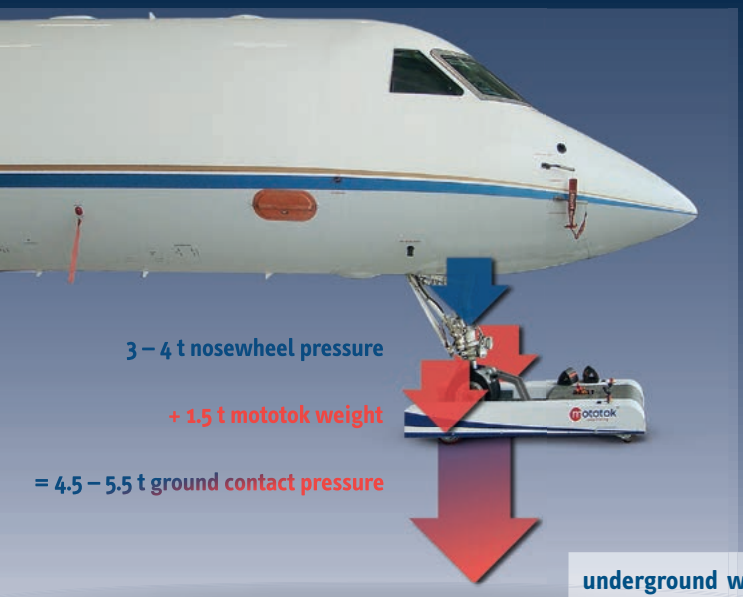
The nosewheels tilt on account of offset nosewheel gear mechanism and are also kept in a fixed tilted position under constant ground contact pressure provided by the hydro-pneumatic system of the model M-Series and TWIN.

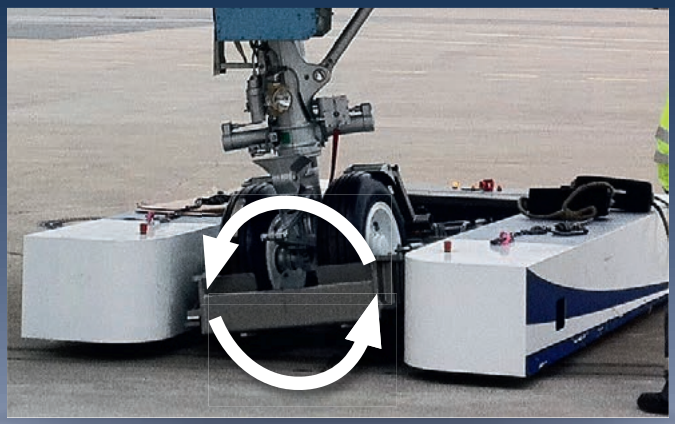
The nosegear platform of the Model SPACER is gimbal-mounted with three hydraulic cylinders. This compensates the tilted position whilst turning the nosegear.

The nose wheel pressure is positioned exactly between the two drive wheels of mototok. So the resulted ground contact pressure is very high. A very high ground contact pressure ratio in relation to the total aircraft weight is attained due to the fact that the driving wheels are 100mm wide. Under these circumstances, mototok can be operated without any problems in rain, snow or on ice.









underground wet	++++
snowy	+++
icy	++

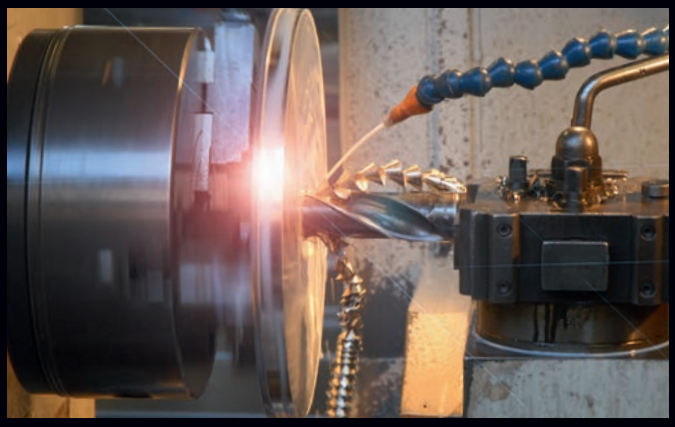
mototok® easy moving

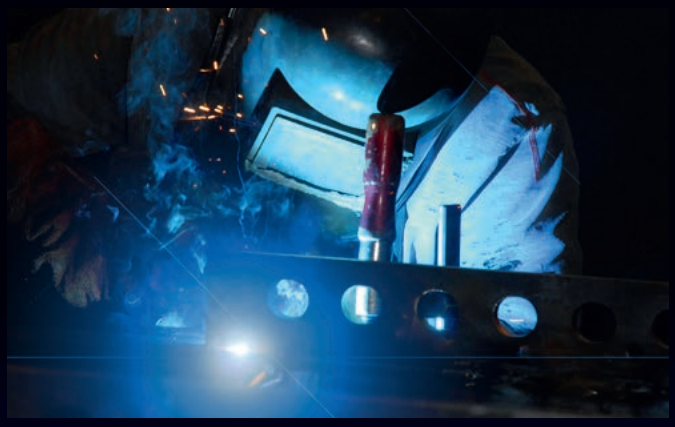
Working with fire and steel:
The mototok production process.

Our innovative built to last aircraft tractors are best equipped for daily heavy use as they consist of high-grade material, hand-picked components according to the finest engineering designs. Our products are capable of withstanding the toughest conditions when exposed to wind and salt water. Thanks to a selection of the finest materials, only limited maintenance is necessary.

Our production process corresponds and applies to all necessary demands and conditions required in the engineering industry.

DIN 18800, DIN 15018, DIN 4112, DIN EN 15614-1, EN 287-1	Certificate of Welding
EN 12895	Immunity requiremts
EN 61000-4-2	Eletrostatic discharge
EN 61000-4-3	Radio-frequency electromagnetic field
DIN 4112, DIN 18800, DIN15018, DIN 4132, DIN 1055	Statics Calculation
DIN EN 10025, DIN 1543, DIN 1013, DIN 17210, DIN 10149-2	Material Steel
2006/42/EC	Machinery Directive (European Community Legislation)
2004/108/EC	EMC Directive (European Community Legislation)
EN 292-1	Safety of Machinery – Basic Terminology, Methodology
EN 292-2	Safety of Machinery – Technical Principles and Specific:ations
EN 418	Safety of Machinery – Emergency Stop Equipment, Functional Aspects
EN 954-1	Safety of Machinery – Safety-Related Parts of Control Systems
EN 95/16/EG	Safety of Machinery – May, 17th 2006
EN 1050	Safety of Machinery – Principles for Risk Assessment
EN 60 204-1	Safety of Machinery – Electrical Equipment of Machines
EN 60 529	Degrees of Protection Provided by an Enclosure
EN 1175-1	Safety of industrial trucks – Electrical requirements for battery powered trucks
EN 13849-1 PL 1 EN	Safety of Machinery – Safety-related parts of control systems
EN 1915	Aircraft ground support equipment – Basic safety requirements
PrEN 12312-7	Aircraft ground support equipment – Aircraft movement equipment
EN 51 000-6-4 (SAE J551 expired code equivalent)	Radiated Electromagnetic Emissions (3rd party tested/certified)



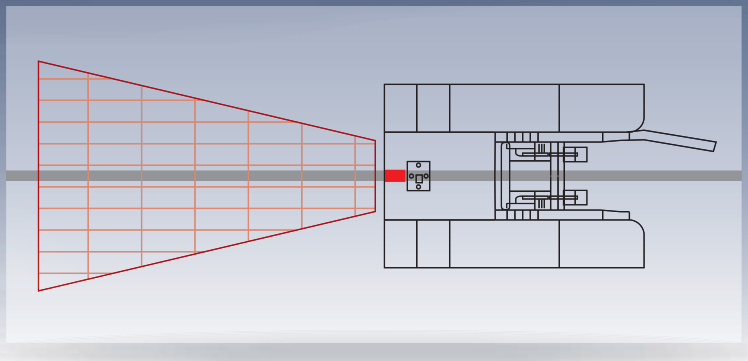


mototok® easy moving

AGV
OPTION
AUTOMATIC GUIDED VEHICLE

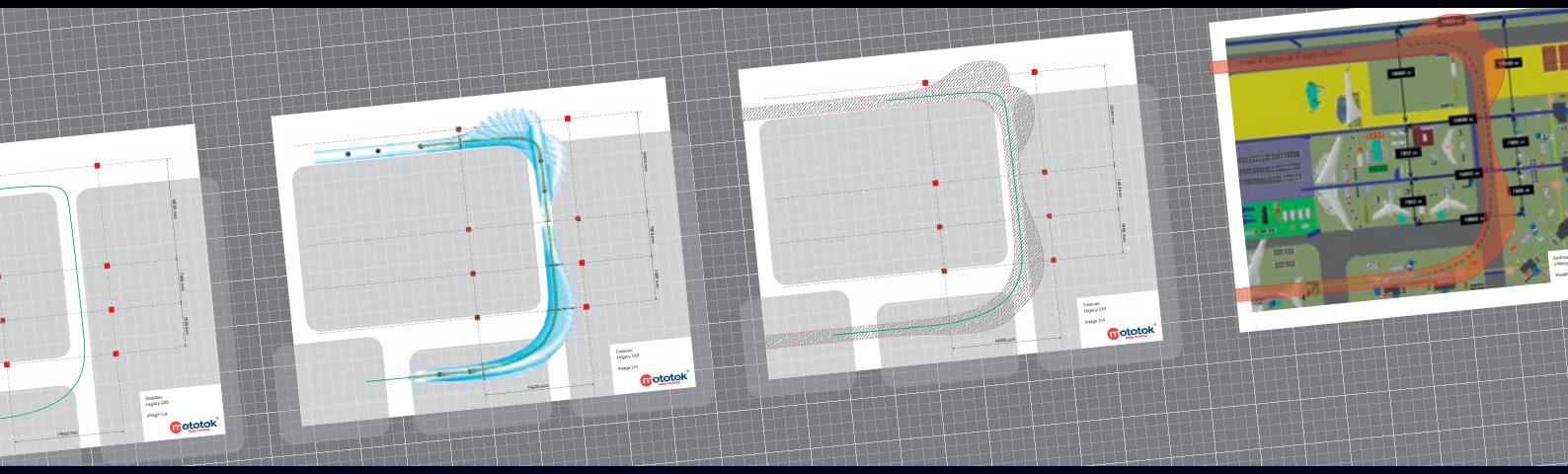
Automatic, camera-guided steering control along track lines installed on the floor.

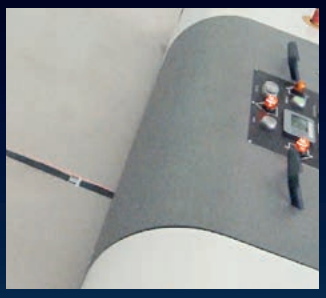
The principle: A camera continuously scans the floor below the mototok. A solid line of defined width is recognized as the guiding line. Next the camera recognises the position and curvature of the guiding line to within 3 mm and when there is a variation in parallelism it reacts with control signals that are led to the drive wheels. By means of different rpms of the two drive wheels, steering is then initiated – mototok follows the line.



Learn more:
www.mototok.com/agv

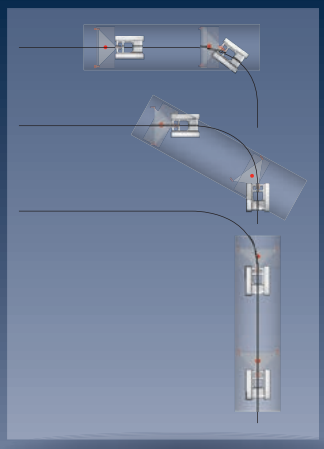
Steering of the greatest precision, placement of the highest accuracy, safety of the highest degree.





Bar codes on the floor make automatic steering of a mototok possible, e.g. if there is a junction, a change in speed or a stop.

On production lines during aircraft manufacture, mototok is a versatile tool that can be used with great flexibility. During assembly, mototok automatically moves the aircraft fuselage to the individual assembly points. In very space-restricted production environments, two synchronized mototoks may also be used, as shown in this example of a production hall design. In addition, we work together with you to develop the optimal path through your hall.



mototok® easy moving

Pushback

Towing capacity up to 95 t / 195 t (210,000 lbs / 430,000 lbs)

SPACER.

SPACER – for large Aircraft.

- Towing capacity up to 95 or 195 t
- Gimbal-mounted nosegear platform with three hydraulic cylinders for compensating the tilt of the nose gear whilst turning
- Electronic torque control for safely and gently turning the nose gear
- Oversteering protection system
- Automatic nose gear engaging function
- For aircraft with a wheel diameter between 450 and 1200 mm
- NTO license for 737's and 320-family

Learn more:
www.mototok.com/spacer

Makes electrical maneuvering up to 195 tons easy.

	SPACER 8600	SPACER 195
applicable for	H	H
Max. towing capacity	95 tons 209440 lbs	195 tons 429900 lbs
Use for	Narrow Body (e.g. A 320-Family, Boeing 737-Family)	Wide Body (e.g. A 300-Family, A 310-Family)
		Narrow Body (e.g. A 320-Family, Boeing 737-Family)
	Regional Jets (e.g. Bombardier Canadair, Embraer)	Regional Jets (e.g. Bombardier Canadair, Embraer)

mototok®
easy moving

Spacer.

Pushback.

SPACERs pushback capabilities take Mototok to a new level of manoevrability on the apron: Since early 2015 Mototok SPACER has NTO license for 737's and 320-family. Now the advantages of a Mototok is playing an increasing role in airport business:

- Easy-to-use
- Only one person needed for operation
- One-click-loading
- Electrical drive
- Low maintenance

mototok® easy moving

TWIN.

TWIN – for Aircraft with a gross weight up to 50 tons.

- Towing capacity 39 or 50 tons
- Fully automatic nose gear engaging function
- Singe or double nose wheel
- Hydraulic adjustment of the mouth opening depth for wheels with small diameter
- Speed up to 1.5 m/s

Towing capacity up to **50 t** (110,230 lbs)

Learn more:
www.mototok.com/twin

Power for big tasks.

	TWIN 3900 AC-AD	TWIN 6500 AC-AD TWIN 6500 AC-AD Flat
applicable for		
Max. towing capacity	39 tons 85980 lbs	50 tons 110230 lbs

mototok®
easy moving

M-SERIES.

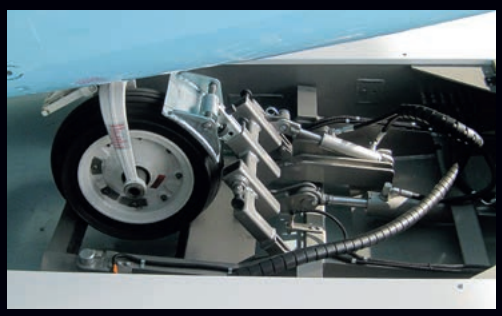
M-SERIES – for Aircraft with a gross weight up to 28 t.

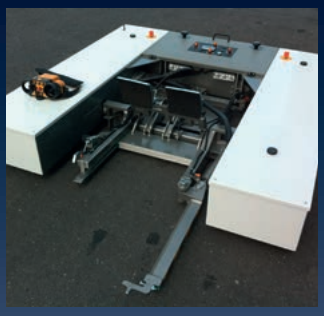
- **Fully automatic nose gear engaging function**
- **Single or double nose wheel**
- **Speed up to 0.89 m/s**

Towing capacity up to 28 t
(61,729 lbs)

Learn more:
www.mototok.com/mseries

For small Machines, Helicopter and Jets.



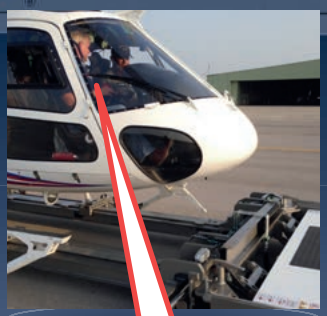


	M-Series M 528
applicable for	
Max. towing capacity	28 tons 61729 lbs

mototok®
easy moving

helimo®

Lifting capacity up to 6 t (13.200 lbs)

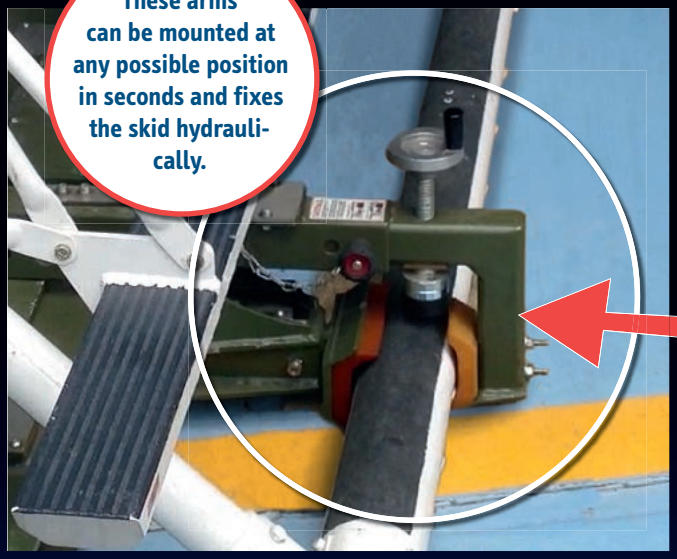


- Highly precise manoeuvrability
- Wireless controlled
- Extremely compact
- Usable for all skidded helicopter in seconds
- No problems with mounted cameras, radar or headlamps underneath the helicopter
- Up to a week of operating time
- Ground-Power included

Remote control the mototok from inside the Aircraft

Learn more:
www.mototok.com/helimo

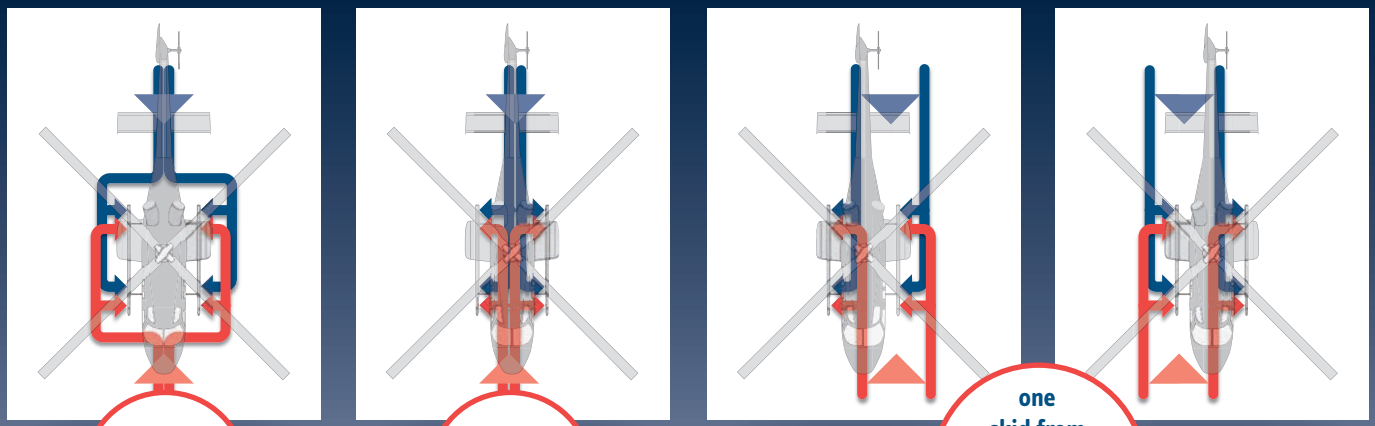
Helimo – the electrical and precise mover for all helicopters with landing skids.



The HELIMO moves every type of helicopter with skids regardless of obstacles such as cameras, radar, floats, winds and weapons mounted on the belly or skids of the helicopter. The HELIMO is universal and easily adjustable to meet the specifications of the helicopter.

With HELIMO, you can pick up your helicopter by several different methods. You have the option of connecting to the skids from the outside or inside of its tubing with the HELIMO remaining outside your Helicopter either from the front or rear position. You also have the option of entering your helicopter under its belly from in front or from the rear and attaching to the skids from its inside tubing. It is possible to combine outside and inside attaching.

Eight principle ways of loading helicopter ...

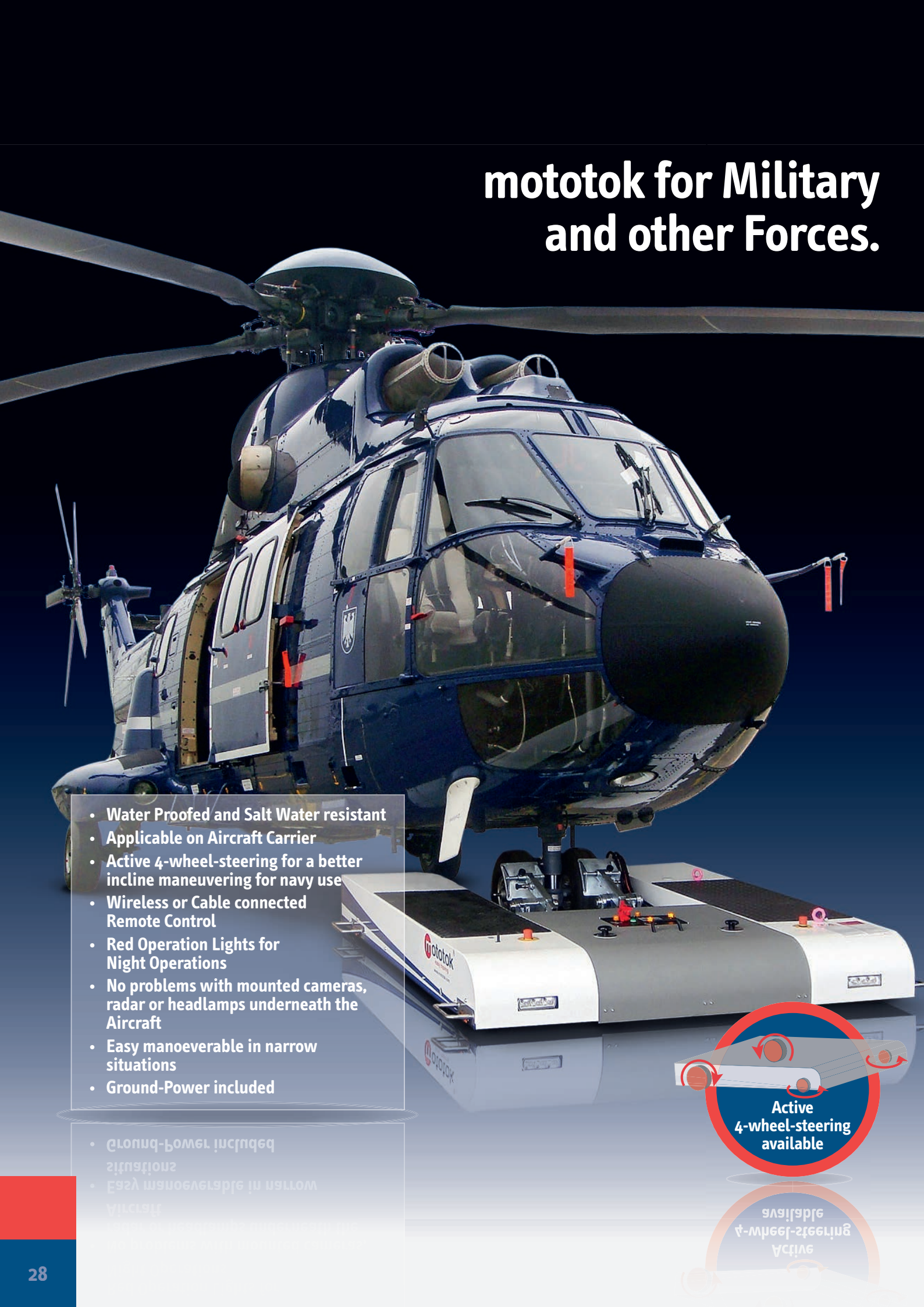


respectively ↑ from the front or ↓ from the back

	Helimo
applicable for	
Max. lifting capacity	6 tons 13228 lbs

mototok® easy moving

mototok for Military and other Forces.



- Water Proofed and Salt Water resistant
- Applicable on Aircraft Carrier
- Active 4-wheel-steering for a better incline maneuvering for navy use
- Wireless or Cable connected Remote Control
- Red Operation Lights for Night Operations
- No problems with mounted cameras, radar or headlamps underneath the Aircraft
- Easy manoeverable in narrow situations
- Ground-Power included

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www.mototok.com/military

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easy moving

TWIN WIDE 14.

Towing capacity up to
55 / 75 / 85 t
(121,254 / 165,347 / 187,393 lbs)

TWIN WIDE – for Aircraft like Lockheed C-130 (Hercules), Embraer KC 390 and suchlike.

- **Towing capacity up to 85 tons**
- **Fully automatic nose gear engaging function**

Low and wide for special aircraft.

	TWIN WIDE 14
applicable for	
Max. towing capacity	55 / 75 / 85 t 121,254 / 165,347 / 187,393 lbs

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Satisfaction guaranteed – our Customers

Airports

Airport Cannes Mandelieu, France	Several Aircraft and Helicopter
Airport Zürich, Switzerland (UNIQUE AG)	Several Aircraft and Helicopter
Airport Málaga-Costa del Sol, Spain	Several Aircraft and Helicopter
Moskow Domodedovo Airport, Russia	Several Aircraft and Helicopter
Airport Lyon Saint Exupéry, France	Several Aircraft and Helicopter
Airport Dresden, Germany	General Aviation
Lugano Airport, Switzerland	Several Aircraft Helicopter Agusta and others
Dallas Love Field	Several Aircraft
Seattle-Tacoma International Airport	Several Aircraft
Philadelphia International Airport	Several Aircraft

Military

Danish Army, Denmark	Challenger, Agusta EH 101, F 16
French Navy / Air Force	Rafale Fighter, SuperPuma, NH 90, EC 155, Panther
Venezuela Military	Helicopters with skids & with wheels
China Military	All kind of Aircraft, Helicopters
U.S. Army National Guard	TWIN
Pakistan Military	HELIMO for Helicopters with skids
CASSIDIAN Manching (EADS), Germany	Tornado & Eurofighter

FBO / MRO

Panaviatic Ltd, Estland	Several Aircraft
Hawker Pacific Asia Pte Ltd, Singapore	Several Aircraft
Jet Legacy Center, Tulsa, USA	Several Aircraft
Perth, Australia	FBO
AERO Dienst Nuremberg, Germany	FBO
Air Service Basel, Switzerland	G5, Global Express, BOEING 737
Flying Group, Antwerpen, Belgium	Several Aircraft
Tarkim Air, Turkey	General Aviation
JetAviation, Geneva, Switzerland	Several Aircraft
Jet Alliance Wien, Austria	Several Aircraft
DUNCAN Aviation	Several Aircraft
Synergy Flight Center	Several Aircraft
ACC Columbia, Hannover & Cologne, Germany	Global & others
Silk Way Airlines, Baku, Azerbaijan	Several Aircraft

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BOEING

Alaska Airlines

BRITISH AIRWAYS

CASSIDIAN AN EADS COMPANY

Aircraft Manufacturers

BOEING	Plant in Philadelphia AGV
Airbus S.A.S., Hamburg, Germany	Spacer
EMBRAER S.A.S. José dos Campos, Brasil	Embraer 195, 190, 175, 170, KC 390
Dassault Aviation, France	Twin
Rosvertol PLC, Russia	Helicopter Production MI-series
Pilatus Aircraft Ltd	PC 12 Maintenance & Delivery
Turkish Aerospace Industries, Inc. (TAI), Turkey	F 16 Fighter Maintenance Facility, Tiger Maintenance Facility
BOMBARDIER, Montreal, Canada	Global Express Delivery Center

Airlines

Alaska Airlines	Spacer for BOEING 737
Air Nostrum, Líneas Aéreas del Mediterráneo S.A, Spain	Challenger, Agusta EH 101, F 16
British Airways	AIRBUS 320 Series
Iberia Líneas Aéreas de España S.A., Spain	Spacer for BOEING and Airbus
Thomson/TUI, Luton, England	BOEING 737 Family

Special Forces

Federal Police, Germany	Helicopter Super Puma, EC 155
Guardia di Finanza Rome, Italy	For ATR
US Cost Guard	Black Hawk

Government

President of Angola	Embraer Legacy
Sultanat of Oman	Eurocopter Super Puma Fleet

Corporations

OAO Gazprom	Several Helicopter & Aircraft
Gazprom, Avia Moscow	Falcon jets
The CocaCola Company	Several Aircraft
L-3, USA	Several Aircraft
Home Depot, USA	Several Aircraft
State Farm, USA	Several Aircraft
Comcast	Several Aircraft
Anglo American, South Africa	Agusta AW139, G5
Novartis AG (JAPAT AG), Basel	Global Express, EC 135

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JET AVIATION

DUNCAN AVIATION

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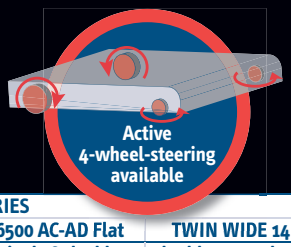
Technical Data



		M-SERIES	TWIN-SERIES				SPACER	
		M 528	3900 AC-AD	6500 AC-AD	6500 AC-AD Flat	TWIN WIDE 14	8600 MA	195 [4]
Use for		single & double nosewheel, wheeled heli-copter	single & double nosewheel, wheeled helicopter	single & double nosewheel, wheeled helicopter	single & double nosewheel, wheeled helicopter	double nosewheel	double nosewheel	double nosewheel
Maximum towing capacity [1]		28 t	39 t	50 t	50 t	55 / 75 / 85 t	95 t	195 t
		61729 lbs	85980 lbs	110231 lbs	110231 lbs	121254 lbs 165347 lbs 187393 lbs	209439 lbs	429901 lbs
Maximum nosewheel weight capacity		2 t	4.5 t	6 t	6 t	7 / 9 / 12 t	10 t	22 t
		4409 lbs	9920 lbs	13228 lbs	13228 lbs	15432 lbs 19842 lbs 26455 lbs	22046 lbs	48502 lbs
Dimensions (without antenna, grips on the surface)	width	1808 mm	2054 mm	2054 mm	2054 mm	2892 mm	2546 mm	3900 mm
		71.18 inch	80.87 inch	80.87 inch	80.87 inch	113.86 inch	100.24 inch	153.54 inch
	lenght	1808 mm	2363 mm	2363 mm	2363 mm	2363 mm	min. 3243 mm	3500 mm
		71.18 inch	93.03 inch	93.03 inch	93.03 inch	93.03 inch	min. 127.68 inch	137.80 inch
							max. (extended nose wheel reception) 3673 mm 144.61 inch	
	height	350 mm	344 mm	344 mm	320 mm	316 mm	553 mm	553 mm
		13.78 inch	13.54 inch	13.54 inch	12.60 inch	12.44 inch	21.77 inch	21.77 inch
Ground clearance		80 mm	88.5 mm	88.5 mm	88.5 mm	85 mm	81 mm	105 mm
		3.15 inch	3.48 inch	3.48 inch	3.48 inch	3.35 inch	3.19 inch	4.13 inch
Width of the wheel opening		500 mm	665 mm	665 mm	665 mm		855 mm	1400 mm
		19.69 inch	26.2 inch	26.2 inch	26.2 inch		33.66 inch	55.12 inch
Depth of the wheel opening		330 mm	min. 180 mm	min. 180 mm	min. 180 mm	min. 100 mm	min. 450 mm	min. 450 mm
		12.99 inch	min. 7.09 inch	min. 7.09 inch	min. 7.09 inch	min. 3.94 inch	min. 17.72 inch	min. 17.72 inch
			max. 670 mm	max. 670 mm	max. 670 mm	max. 600 mm	max. 1200 mm	max. 1200 mm
			max. 26.38 inch	max. 26.38 inch	max. 26.38 inch	max. 23.66 inch	max. 47.24 inch	max. 47.24 inch
Unladen weight		870 kg	1700 kg	1700 kg	1700 kg	3500 kg	4035 kg	13000 kg
		1918 lbs	3750 lbs	3750 lbs	3750 lbs	7716 lbs	8896 lbs	28660 lbs
Hydraulic wheel opening doors		incl. full hands free hydraulic door	incl. full hands free hydraulic door	incl. full hands free hydraulic door	incl. full hands free hydraulic door	incl. full hands free hydraulic door	incl. full hands free hydraulic door	incl. full hands free hydraulic door
Time to load/fix aircraft		10 sec	10 sec	10 sec	10 sec	approx. 15 sec	10 sec	
Speed		3.2 km/h	5.4 km/h	5.4 km/h	5.4 km/h	2.5 – 6 km/h	5.4 km/h	10 km/h
		0.89 m/s	1.5 m/s	1.5 m/s	1.5 m/s	0.69 – 1.67 m/s	1.5 m/s	2.78 m/s
		2 mph	3.36 mph	3.36 mph	3.36 mph	1.55 – 3.73 mph	3.36 mph	6.21 mph
Batteries (maintenance-free, deep cycle gel batteries)		4 x 115 Ah	4 x 140 Ah	4 x 200 Ah	4 x 200 Ah	4 x 200 Ah	Armour Plate 300 Ah with electrolyte recirculation	
Voltage		48 V	48 V	48 V	48 V	48 V	80 V	
Range (depending on the		2 days	3-4 days	3-4 days	3-4 days	3-4 days	3-4 days	
Possible terrain		Concrete, stone, asphalt	Concrete, stone, asphalt	Concrete, stone, asphalt	Concrete, stone, asphalt	Concrete, stone, asphalt	Concrete, stone, asphalt	Concrete, stone, asphalt
Tyres		Puncture-proof tyres	Puncture-proof tyres	Puncture-proof tyres	Puncture-proof tyres	Puncture-proof tyres	Puncture-proof tyres	Puncture-proof tyres
Radio remote control		Radio remote control (with safety features, waterproof, certification of conformity), worldwide safety approval, including airports, TÜV certified						
Optional Equipment								
Hydraulic nosewheel securing [2]		inclusive	inclusive	inclusive	inclusive	inclusive	inclusive	inclusive
Ground power cable for gound power connection 13.4V / 25,6 V (short time up to 1300 A) [3]		available	available	available	available	available	not available	not available
Driving light (LED, 10,000 hour operating life, very high beam range)		inclusive	inclusive	inclusive	inclusive	inclusive	inclusive	inclusive
Yellow flashlight		available	inclusive	inclusive	inclusive	inclusive	inclusive	inclusive
Safety beeper		available	inclusive	inclusive	inclusive	inclusive	inclusive	inclusive
Trailer coupling adaptor for multi-functional extensions		available	available	available	available	available	not available	not available
Military spiral cable connection (15 m) between aggregate and control unit		available	available	available	available	available	available	available
Automatic controls by ground markings (AGV functionality)		available	available	available	available	available	available	available
Adaptations for special demands (i.e. military version / range of production)		available	available	available	available	available	available	available

Mistakes and technical alterations reserved / Date 09.2014

1) The stated towing capacity is valid for towing on normal ground conditions without an incline of more than 1 %.

2) This prevents the nosewheel from rising and slipping out of position. The securing device is hydraulically lowered onto the nosewheel and securely locked at the push of a button. Standard: mechanical securing system.

3) In most aircraft, the generator voltage is 28.4 V. The 25.6 V on-board batteries are charged with this voltage. With the mototok ground power supply, the on-board voltage can be maintained and used to start the turbines.

4) Some technical data of the type SPACER 195 may change due to further development and are not fixed yet.

HELIMO IV

Use for		**skidded helicopter**
Lifting capacity		6 t
		13228 lbs
Dimensions / overall max	lenght	6800 mm
		267.72 inch
	width	5760 mm
		226.77 inch
	height	650 mm
		25.59 inch
Dimensions / overall min (load area)	lenght	6600 mm
		259.84 inch
	width	2300 mm
		90.55 inch
	height	250 mm
		9.84 inch
Length of the extension arms		3960 mm
		155.91 inch
Cantilever arms	lenght	300 mm
		11.81 inch
	width	150 mm
		5.91 inch
Ground clearance		100 mm
		3.94 inch
Unladen weight		2.7 t
		5952 lbs
Voltage		48 V
Speed		5.4 km/h
		1.5 m/s
		3.36 mph
Tyres: Puncture-proof tyres		
Radio remote control (with safety features, waterproof, certification of conformity), worldwide safety approval, including airports (TÜV certified)		
24/28V Groundpower inclusive for engine start and updates		
Yellow flashlight inclusive		

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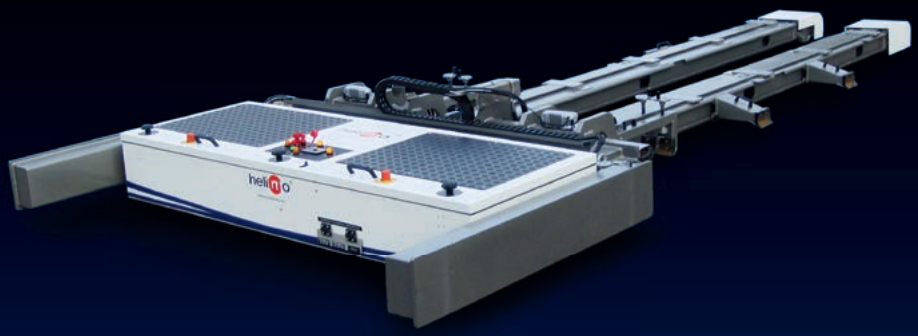

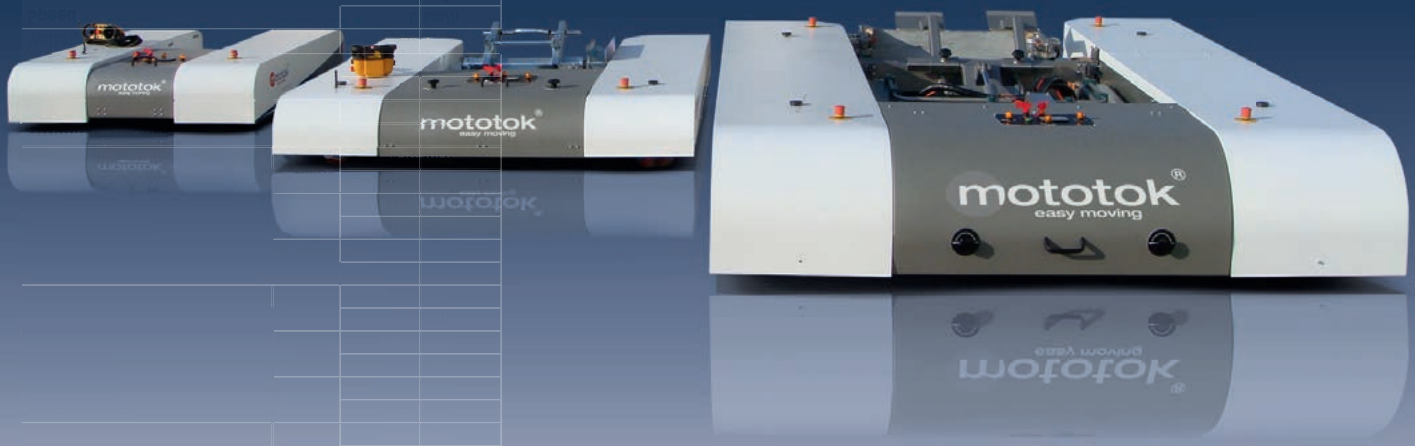

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About mototok

With the mototok, logistical tasks at Aircraft Production Line Facilities, MRO, FBO and Airport Operations can now be solved in more effective, safe and economical manner.

Whatever logistical requirement, the mototok's ability to generate more space safely and precisely with the added advantage of a complete hands free connection to the nosewheel, hydro-pneumatic suspension system and a free roaming 100% visibility anywhere around the aircraft have put them in a class of their own.

Only the mototoks can maneuver an aircraft's nose, tail section or wing just a few millimeters away from a hangar wall or the next aircraft body part. By simply applying the creeper snail mode speed feature on the remote control, the operator can slowly inch the aircraft safely and effectively to its final resting place in the production line, maintenance stand, hangar corner or parking area.

mototok has primarily self-developed this innovative wireless transmission control dual-motor-principal technology which applies proven digital control engineering mostly used the automotive and truck industries.

Due to a decentralized alignment of the mototok's standardized CAN bus components, the need of cable complexities is no longer an issue. Because of this unique ability, we have convinced the world's foremost Aerospace companies including AIRBUS, The BOEING Company, CASSIDIAN, DASSAULT, EMBRAER, BOMBARDIER and PILATUS who operate mototoks in their day to day operations and know firsthand the major advantages they have to offer.

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